IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

12 Appeal Brief
CJ Cyber
7.24.03

In re Application of:	**van Diggelen**	Docket No.:	**GLBL 005D2**
Serial No.:	**09/989,558**	Filed:	**November 20, 2001**
Group Art Unit:	**3661**	Examiner:	**Edward J. Pipala**

Title: **METHOD AND APPARATUS FOR LOCATING MOBILE RECEIVERS USING A WIDE AREA REFERENCE NETWORK FOR PROPAGATING EPHEMERIS**

BRIEF ON APPEAL

Mail Stop Appeal Brief-Patents
Honorable Commissioner of
Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The following appeal brief is submitted pursuant to the Notice of Appeal filed on May 15, 2003, and received by the Patent Office on May 19, 2003, in the above-identified application.

REAL PARTY IN INTEREST

The real party in interest is Global Locate, Inc.

RELATED APPEALS AND INTERFERENCES

No other appeals or interferences that directly affect, or are directly affected by, or have a bearing on the Board's decision in the pending appeal are known to the Appellant, the Appellant's legal counsel, or the Assignee.

STATUS OF CLAIMS

Claims 36-38 stand under final rejection, from which rejection this appeal is taken.

STATUS OF AMENDMENTS

In a first Office Action dated September 10, 2002, the Examiner rejected claims 36-38 under 35 U.S.C. §112 and 35 U.S.C. §102(e). In response to the first Office Action, the Appellant amended claim 36, made no changes to claims 37-38, and set forth arguments traversing the rejections issued by the Examiner.

In a Final Office Action dated February 26, 2003, the Examiner withdrew the rejection of claims 36-38 under 35 U.S.C. §112 and reiterated the rejection of claims 36-38 under 35 U.S.C. §102(e), as set forth in the first Office Action. The Appellant filed an after-final response under 37 C.F.R. §1.116 to overcome the Examiner's rejections stated in the Final Office Action. In the after-final response, the Appellant made no changes to claims 36-38 and set forth arguments traversing the rejections reiterated by the Examiner.

In an Advisory Action mailed May 2, 2003, the Examiner sustained the final rejection of claims 36-38 under 35 U.S.C. §102(e), as set forth in the Final Office Action.

SUMMARY OF INVENTION

The present invention is a method of receiving global positioning system (GPS) satellite signals that improves acquisition sensitivity at a mobile GPS receiver. A conventional GPS receiver locates position by computing relative times of arrival of signals transmitted simultaneously from satellites that orbit the earth. A conventional GPS receiver acquires satellite signals by performing a two-dimensional search process over an entire range of possible satellite signal frequencies and an entire range of possible satellite signal delays. Since the GPS receiver must search many possibilities of both frequency and delay, the time to acquire the satellite signals is long. Moreover, a conventional GPS receiver may be unable to acquire the satellite signals in low signal strength environments, such as indoor environments. (See Appellant's specification, page 1, lines 16-31).

The present invention reduces the amount of time required to acquire satellite signals at a mobile GPS receiver. Notably, the present invention

receives satellite ephemeris at a first location and then transmits the ephemeris to a mobile GPS receiver at a second location. Ephemeris contains an accurate description of position, velocity, and clock errors for a particular satellite. The present invention uses the ephemeris to reduce both the range of possible satellite signal frequencies and the range of possible satellite signal delays during signal acquisition at the mobile GPS receiver. (Appellant's specification, page 15, lines 1-12). Alternatively, the present invention may use the ephemeris to generate a pseudo-range model, which may be used in place of the ephemeris. For example, a pseudo-range model may comprise a model of the expected pseudo-range, pseudo-range rate, and pseudo-range acceleration at the mobile device that is valid for a particular period of time. (Appellant's specification, pages 10-12; FIG. 5). In this manner, the mobile GPS receiver requires less time to acquire satellite signals and is more sensitive for low signal strength environments.

As suggested in MPEP 1206, the Appellant now reads the broadest appealed claim on the specification and on the drawings. It should be understood, however, that the appealed claim may read on other portions of the specification or other figures that are not listed below.

In one embodiment, satellite ephemeris is received at a first location (Appellant's specification, page 5, line 31 through page 6, line 6; FIG. 1, elements 104 and 108; FIG. 5, step 502). The satellite ephemeris is communicated to a mobile GPS receiver at a second location. (Appellant's specification, page 6, lines 7-21; FIG. 1, element 120; FIG. 5, step 514). Satellite signals that are received at the mobile GPS receiver are processed using the ephemeris to reduce code and frequency uncertainty therein and improve acquisition sensitivity. (Appellant's specification, page 15, lines 6-12; FIG. 7).

For the convenience of the Board of Patent Appeals and Interferences, the Appellant's claim 36 (the broadest independent claim) is presented below in claim format with elements read on FIGs. 1, 5, and 7 of the drawings, as suggested in MPEP 1206. Claim 36 positively recites (with reference numerals added):

"A method of receiving global positioning system (GPS) satellite signals comprising:

receiving (502) satellite ephemeris at a first location (104, 108);

communicating (514) the satellite ephemeris to a mobile GPS receiver (114, 118) at a second location; and

processing (704) satellite signals received at the mobile GPS receiver (114, 118) using the ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver to improve acquisition sensitivity of the mobile GPS receiver (114, 118)."

ISSUE

Whether claims 36-38 are anticipated under 35 U.S.C. §102(e) by Moeglein (United States patent 6,215,441, issued April 10, 2001).

GROUPING OF CLAIMS

The rejected claims have been grouped together in the rejections. The Appellant urges that each of claims 36 and 38 stands on its own recitation, the claims being considered to be separately patentable for reasons set forth in more detail infra. Claim 37 stands and falls together with claim 36.

THE REFERENCES

The following reference is relied on by the Examiner:

Author	Publication Title or Reference number	Publication Date
Moeglein	U.S. Patent No. 6,215,441	April 10, 2001

BRIEF DESCRIPTION OF THE REFERENCE

Moeglein generally teaches a system having satellite position system (SPS) reference receivers dispersed over a geographic region for receiving satellite navigation information (e.g., ephemeris) (See Moeglein, Abstract). A location server receives the satellite ephemeris data from the reference network. In one embodiment, a mobile receiver computes pseudo-ranges to a plurality of satellites and transmits the pseudo-ranges to the location server. The location server then uses the pseudo-ranges along with the ephemeris to compute the

position of the mobile receiver in a conventional manner. (Moeglein, col. 7, lines 18-29). In another embodiment, the location server transmits the ephemeris to the mobile receiver through a communication network. The mobile receiver computes pseudo-ranges to a plurality of satellites and uses the pseudo-ranges along with the ephemeris to compute position. (Moeglein, col. 14, lines 4-16). Moeglein further teaches that the location server may also transmit Doppler prediction data and/or satellite almanac and/or pseudo-range corrections to the mobile receiver. (Moeglein, col. 14, lines 38-41).

ARGUMENT

A reasonable interpretation of the reference as proposed by the Examiner in the first Office Action and the Final Office Action does not anticipate the invention recited in the Appellant's claims. More specifically, Moeglein does not teach or suggest processing satellite signals at a mobile GPS receiver using ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver. Rather, Moeglein uses ephemeris information along with pseudo-ranges that have already been obtained at a mobile GPS receiver to compute position in a conventional manner. That is, Moeglein searches for and acquires satellite signals without using the ephemeris information. Only after the pseudo-ranges have been obtained, which is by definition after the satellite signals have been searched for and acquired at the GPS receiver, does Moeglein use ephemeris information in a conventional manner to locate the position of the mobile GPS receiver. Moeglein does not teach or suggest using ephemeris information to reduce code and frequency uncertainty at the mobile GPS receiver. These issues are discussed below in detail with regard to each of the rejected claims.

I. REJECTION OF CLAIMS 36-37 UNDER 35 U.S.C. §102(e) OVER MOEGLEIN

The Examiner rejected claims 36-37 as being anticipated by Moeglein. The rejection is respectfully traversed.

More specifically, the Examiner alleged that Moeglein teaches a plurality

of reference receivers dispersed over a geographical region that receive satellite ephemeris data and transmit the ephemeris data into a communication network. (Final Office Action, pp. 2-3). The Examiner stated that "[t]he first digital processing system receives a first pseudo-range data from a first SPS mobile receiver and calculates a first position information of the first SPS mobile receiver from a representation of the first pseudo-range data and from satellite ephemeris data received from the communication network." (Final Office Action, page 3) (emphasis added). The Examiner also stated that "the transmission of satellite ephemeris data as taught by Moeglein et al. above clearly aids in reducing code and frequency uncertainty by eliminating the need to derive the ephemeris data directly from each and every satellite which might be in view of the mobile receiver." (Final Office Action, page 4). The Examiner concluded that Moeglein anticipates the Appellant's invention recited in claim 36. The Appellant respectfully disagrees.

Moeglein does not teach each and every element of the Appellant's claim 36. Namely, Moeglein does not teach or suggest processing satellite signals at a mobile GPS receiver using ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver. Specifically, the Appellant's claim 36 positively recites:

> "A method of receiving global positioning system (GPS) satellite signals comprising:
>
> receiving satellite ephemeris at a first location;
>
> communicating the satellite ephemeris to a mobile GPS receiver at a second location; and
>
> processing satellite signals received at the mobile GPS receiver using the ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver to improve acquisition sensitivity of the mobile GPS receiver." (Emphasis added).

Notably, the Appellant's invention as recited in claim 36 advantageously uses ephemeris information to reduce both the range of possible satellite signal frequencies, and the range of possible satellite signal delays, at a mobile GPS receiver when acquiring satellite signals. This allows the invention to search a small range during the two-dimensional satellite signal search process thereby eliminating a time consuming sequential search and allowing for longer signal

integration times. (See Appellant's specification, page 14, line 31 through page 15, line 13; Figure 6).

Moeglein is completely devoid of any teaching or suggestion of using ephemeris information to reduce uncertainty in the two-dimensional satellite signal search process. Nowhere in Moeglein is the ephemeris data used during the acquisition of satellite signals, and nowhere does Moeglein state that ephemeris data may be used to reduce code and frequency uncertainty at the mobile GPS receiver. Rather, Moeglein states that the GPS receiver performs a pseudo-range determination by receiving (i.e., acquiring) GPS signals from GPS satellites through a GPS antenna. (See Moeglein, col. 7, lines 50-53). In other words, Moeglein receives satellite signals to compute pseudo-ranges without receiving ephemeris data to aid in the satellite signal acquisition process, such as by reducing the code and frequency uncertainty in the search process.

In contrast to using the ephemeris data to reduce code and frequency uncertainty, Moeglein states that ephemeris data is used in a conventional manner with the pseudo-ranges to locate position. Moeglein specifically states: "It will be appreciated that the satellite ephemeris data obtained from the network through the modem or other interface 54 may be used in a conventional manner with the pseudo-ranges obtained from the mobile GPS receiver in order to compute the position information for the mobile GPS receiver." (Moeglein, col. 7, lines 24-29). Thus, in terms of an operational timeline, Moeglein uses the ephemeris information only after the GPS receiver has received the satellite signals and determined the pseudo-ranges.

While Moeglein does teach transmitting the ephemeris to the GPS receiver, Moeglein states: "[A] mobile SPS receiver may determine its own position by receiving SPS signals and determining pseudo-ranges and by receiving and using satellite ephemeris data." (Moeglein, col. 14, lines 11-14). Thus, Moeglein again teaches a two step position determination process: First receive satellite signals and determine pseudo-ranges, and second using the pseudo-ranges with the ephemeris to compute position. Using ephemeris in a conventional position computation process fails to teach or suggest using

ephemeris to reduce code and frequency uncertainty when processing satellite signals.

The Appellant respectfully disagrees with the Examiner's statement that by eliminating the need to derive ephemeris data directly from each satellite, Moeglein clearly aids in reducing code and frequency uncertainty. Even if the GPS receiver of Moeglein does not have to derive ephemeris from each satellite, the GPS receiver still must receive GPS signals to compute pseudo-ranges. Thus, Moeglein must still search for and acquire GPS signals despite not having to receive ephemeris. As discussed above, Moeglein is completely devoid of any teaching or suggestion of reducing signal search time, such as by reducing code and frequency uncertainty, while receiving the GPS signals.

The Appellant also respectfully disagrees with the Examiner's statement that reducing code and frequency uncertainties is "essentially the only reason ephemeris data is transmitted and used by mobile receivers." (Final Office Action, page 5). As stated by the Examiner, conventional GPS receivers first search for and acquire GPS signals, and then read the navigation message from the signals to obtain ephemeris. In a conventional GPS receiver, since obtaining ephemeris comes after searching for and acquiring satellite signals, ephemeris is clearly not used to reduce code and frequency uncertainties during the search process. In addition, Moeglein clearly states that the reason for the ephemeris information is to compute device position. Nowhere does Moeglein state that the only reason for transmitting the ephemeris data is to reduce code and frequency uncertainty.

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim." Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). Since Moeglein is devoid of any teaching or suggestion of processing satellite signals received at the mobile GPS receiver using the ephemeris to reduce code and frequency uncertainty, Moeglein fails to teach each and every element of Appellant's claim 36. Therefore, the Appellant contends that claim 36 is not anticipated by Moeglein

and, as such, fully satisfies the requirements of 35 U.S.C. §102(e).

Furthermore, claim 37 depends from claim 36 and recites additional features therefor. Since Moeglein does not anticipate claim 36, Moeglein cannot anticipate dependent claim 37. Therefore, the Appellant contends that claim 37 is not anticipated by Moeglein and, as such, fully satisfies the requirements of 35 U.S.C. §102(e).

II. REJECTION OF CLAIM 38 UNDER 35 U.S.C. §102(e) OVER MOEGLEIN

The Examiner rejected claim 38 as being anticipated by Moeglein. The rejection is respectfully traversed.

First, claim 38 depends from claim 36 and recites additional features therefor. As such, the Appellant repeats the same arguments as set forth above in Section I. Namely, Moeglein does not teach or suggest processing satellite signals received at the mobile GPS receiver using the ephemeris to reduce code and frequency uncertainty, as recited in claim 36. Since Moeglein does not anticipate claim 36, Moeglein cannot anticipate dependent claim 38.

Second, claim 38 recites the additional feature of "generating a pseudo-range model from said satellite ephemeris and communicating the pseudo-range model to the mobile receiver." Moeglein is devoid of any teaching or suggestion of computing a model from the ephemeris information and propagating the model to the mobile GPS receiver. In addition, the Examiner has not pointed to any specific teachings in Moeglein of generating a pseudo-range model from the ephemeris information and transmitting the model to the GPS receiver. Rather, Moeglein merely transmits the unaltered ephemeris information to the mobile GPS receiver. As such, Moeglein does not teach or suggest each and every element of the Appellant's claim 38. Therefore, the Appellant contends that claim 38 is not anticipated by Moeglein and, as such, fully satisfies the requirements of 35 U.S.C. §102(e).

CONCLUSION

For the reasons advanced above, the Appellant respectfully urges that the

rejection of claims 36-38 as being anticipated under 35 U.S.C. §102(e) is improper. The Appellant respectfully requests reversal of the rejections in this appeal.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. If necessary, please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 20-0782 and please credit any excess fees to such deposit account.

Respectfully submitted,

7-14-03

Raymond R. Moser, Jr.
Attorney for the Appellant
Reg. No. 34,682

*****EXPRESS MAIL CERTIFICATION*****

"Express Mail" mailing label number **EV286961683US**
Date of deposit July 14, 2003

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Honorable Commissioner for Patents, Alexandria, VA 22313-1450.

Carol Wilson
Signature of person mailing paper or fee

Carol Wilson
Name of person mailing paper or fee

APPENDIX

CLAIMS UNDER APPEAL IN S/N 09/989,558

36. A method of receiving global positioning system (GPS) satellite signals comprising:

receiving satellite ephemeris at a first location;

communicating the satellite ephemeris to a mobile GPS receiver at a second location; and

processing satellite signals received at the mobile GPS receiver using the ephemeris to reduce code and frequency uncertainty in the mobile GPS receiver to improve acquisition sensitivity of the mobile GPS receiver.

37. The method of claim 36 wherein said communicating step is performed through a wireless path.

38. The method of claim 36 further comprising generating a pseudo-range model from said satellite ephemeris and communicating the pseudo-range model to the mobile receiver.